POWER REQUIREMENT STUDY:

O PANHANDLE RURAL ELECTRIC MEMBERSHIP ASSOCIATION

NEBRASKA 84 GRANT

(Revised)



Prepared by
Program Analyst
Office of the Administrator
RURAL ELECTRIFICATION ADMINISTRATION

August 1952

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Foreword

This study has been prepared by the Rural Electrification Administration for use in determining the present and estimated future power requirements of the Panhandle Rural Electric Membership Association (Nebraska 84 Grant).

The estimates of future loads contained in the study have been arrived at from a field survey in the Cooperative's area and from basic data obtained in the Cooperative's office. The estimates of kwh consumption for farm, nonfarm and town residential consumers used herein are based upon a projection of historical trends in consumption, type of farm, income, competitive sources of energy, and other economic factors which are believed to have a bearing on the future use of electricity in this area.

The estimates of average unit kilowatt demands per consumer at peak load, corresponding to the estimated average kilowatt-hour consumption per member per month of farm, nonfarm and small commercial consumers, have been derived from the curve "Maximum Demand at Substation" accompanying Engineering Memorandum No. 94R5 of the Engineering Division, REA, dated August 21, 1950. The total number of consumers to be served in each substation area, rather than the number of consumers in a particular class, was used as a basis in arriving at the total and unit demands in order to reflect the probable overall diversity between classes of consumers in a given substation area. No adjustment for a power factor less than unity was applied, it being assumed for estimating purposes that the KVA demand as read from the curve was equal to the KW demand at the substation.

Summary and Conclusions

Pertinent information reflecting the data and conclusions arrived at regarding the present and future number of consumers, kilowatt-hour requirements, and kilowatt demands for the Panhandle Rural Electric Membership Association (Nebraska 84 Grant) are included in the attached Tables I to III, inclusive.

Table III (Estimate of Loads) indicates that approximately 1,359 consumers will be served by the Cooperative in 1954, 1,534 in 1957, and 1,584 in 1962, at an estimated maximum demand at substation of 1,848 kilowatts in 1954, 2,562 kilowatts in 1957, and 3,318 kilowatts in 1962. Likewise, it is estimated that the Cooperative's annual energy requirements at substations will approximate 6,3 million kilowatt-hours in 1954, 8,4 million kilowatt-hours in 1957, and 10,4 million kilowatt-hours in 1962.

2/ Based on a field survey conducted by Frank G. Coover, Field Representative, Office of the Administrator, REA and W. M. Letcher, Field Representative, REA, USDA.

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The degree of attainment of area coverage by the Cooperative, as well as the achievement of the estimated kilowatt-hour consumption foreseen in this report, are contingent on the following important considerations:

- 1. An adequate, dependable source of low-cost power supply.
- 2. Dependable, adequate electrical power to the ultimate consumer with a minimum of interruption in service and at the lowest retail rate commensurate with "pay out" considerations.
- 3. A fully prosecuted power use program designed to attain the goals of saturation of appliances and farm equipment reflected by the estimates included in this report.

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TABIE 1

COMPARATIVE ANNUAL OPERATING DATA ON CONSUMERS AND AVERAGE MONTHLY CONSUMPTION

| | FA | FARM | | NONFAR | NONFARM RESIDENTIAL | IAL | TIMES | SMALL COMMERCIAL | | TOWN | TOWN DECEDENTIAL | Toola Del |
|---|---|---------|--------------|---------|---------------------|----------------|---------|------------------|---------------|---------|------------------|-----------|
| YEAR | MEMBERS | AVERAGE | 4GE | MEMBERS | AVERAGE | AGE | MEMBERS | AVERAGE | E. | MEMBERS | AVERAGE | JUE . |
| | NO. | KWH/MO. | \$INCR. | NO. | KWH/MO. | SINCR. | NO. | KITH/MO. | SINCR. | NO | KWH/MO. | %1NCR. |
| 1949 | 238 | 168 | S Mes | # | 53 | 1 | 57 | 306 | 1 | 362 | oot | ı |
| 1950 | 375 | 221 | 3105 | 8 | 13 | ~1505 | 80 | 297 | 2.9 | 223 | 76 | 0-6- |
| 1961 | 209 | 262 | 18.6 | 38 | 99 | 407.7 | 66 | 012 | 1-6- | 254 | 112 | 15.5 |
| 1952 1/ | 629 | 315 | 8 | 2 | 36 | : | 140 | 199 | g 8 | 305 | 122 | ł |
| SUM OF YEARLY %1 (1949 - 1951) AVERAGE PER YEAR | SUM OF YEARLY %INCR. (1949 - 1951) AVERAGE PER YEAR | ÷ | 50.1 25.0 | | | 332.2 166.1 | | | *12°0 *6°0 | | | 1205 |

1/ SIX MONTHS ONLY.

NOTE: CONTINUED ON NEXT PAGE.

PROGRAM ANALYST, OFFICE OF THE ADMINISTRATOR, REA - AUG. 1952

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TABLE ! (CONT D.)

COMPARATIVE ANNUAL OPERATING DATA ON CONSUMERS AND AVERAGE MONTHLY CONSUMPTION

| YEAR | MEMBER: | ET LIGHTI S AVER | THE RESIDENCE OF THE PERSON NAMED IN | LG. CO | MMER & | | MEMBERS | TOTAL | A.O.E. |
|------------------|--------------------|---------------------|--------------------------------------|--------|--|----------------|--|---------------------|--|
| | NO e | KWH/MO. | %INCR. | NO a | STREET, SQUARE, STREET, STREET | %INCR. | NO. | KWH/MO . | |
| 1949 | 1 | 1 9 3 4 3 | | 20 54 | , | | 459 | 163 | |
| 1950 | 1 | 2,136 | 59.0 | 1 | 1,865 | | 691 | 189 | 16.0 |
| 1951 | 1 | 1,144 | -46.4 | 3 | 4,918 | 163.7 | 1,001 | 225 | 19.0 |
| 1952 1/ | 1 | 1 : 400 | | 3 | 3,037 | ent ann | 1,131 | 285 | er ws |
| SUM OF Y | | | , | | | | AT PARTY AND A PARTY OF THE PAR | THE PERSON NAMED IN | A CONTRACTOR OF THE PROPERTY O |
| (1949 AVERAGE | - 1951) PER YEA | | 12.6 | | | 163.7 163.7 | | | 95.0 17.5 |

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| | | ack, t | | ¢. | TROVE | | 1950 | 7-5 | (*) |
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TABLE 11

COMPARATIVE ANNUAL OPERATING DATA ON ENERGY REQUIREMENTS

| YEAR | PURCHASED | SED | SOLD | | Los Los | ENER GY LOSSES | KW | SFRVICES | TOTAL | OVERALL | AVERAGE |
|--|---|---------------|--|-------------|------------|-------------------|--------|-----------|-----------|-----------|-----------|
| | KWH | % INCR. | Z-H | %INCR. | KWH | %1.0SS | DEMAND | CONNECTED | ENERGIZED | DENS 1 TY | |
| 1948 1/ | 311,9558 | * | 278,805 | 1 | 32,753 | 10.5 | * | 012 | 125 | 2016 | \$ +04682 |
| 1949 | 956618081 | i i | 900,535 | (2) May (2) | 181,421 | 16.8 | * | 632 | 400 | 1.58 | 02396 |
| 1950 | 1,879,998 | 1308 | 1,571,3495 | 7405 | 308,503 | 1624 | * | 894 | 988 | 1001 | *01805 |
| 1951 | 3,380,754 | 79°8 | 2,702,424 | 72.0 | 678,330 | 2001 | * | 1,088 | 890 | 1,22 | £8600° |
| 1952 2/ | 2,121,000 | 8 | 1,733,363 | ŧ | 769. 786 | 18.3 | 958 | 1,182 | 1,277 | 0°63 | 012000 |
| SUM OF YEARLY %11 (1949 - 1951) AVERAGE PER YEAR | SUM OF YEARLY %INCR. (1949 - 1951) AVERAGE PER YEAR | 559.6 76.8 | And the second s | 146.5 | | 1801 | | | | | |

1/ PARTIAL YEAR.
2/ SIX MONTHS OPERATIONS.
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| AND | | * | 200 | | | 2 5 | NA TANK | TOTAL | TATOR | | |

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TABLE 111

ESTIMATE OF LOADS - ALLIANCE METERING POINT

| NEBRASKA 84 GRANT (REV.) | | | | | | | | | |
|-----------------------------|---|--|--|-----------------------------------|--|--|------------|-------------------------|------------|
| | NUMBER | NUMBER OF CONSUMERS | UMERS | | KW DEMAND | | ANN | ANNUAL KWH REQUIREMENTS | REMENTS |
| TYPE OF CONSUMER | 1954 | 1957 | 1962 | 1954 | 1957 | 1962 | 1954 | 1957 | 1962 |
| | | | | @10032 | @1.243 | @1.621 | , 009€∅ | @4500 | , 00090 |
| FARM (1) | 400 | 410 | 425 | 413 | 510 | 689 | 1,9440,000 | 1,845,000 | 2,550,000 |
| | | | | @1.398 | @1.468 | @1.621 | 65040 | @5400 ' | , 00090 |
| FARM (2) | 485 | 635 | 650 | 678 | 932 | 1,054 | 2,444,400 | 3,429,000 | 3,900,000 |
| | | | | @0.174 | @0.213 | 00,253 | @480 | , 0090 | @720 ' |
| NONFARM (RES) | 7 | 5 | 5 | - | 1 | | 2,400 | 3,000 | 3,600 |
| | | | | @1.260 | @1°318 | @1.468 | @4500 | ©4800 \ | @5400 |
| SNA11 COMMERCIAL | 80 | 80 | 80 | 101 | 105 | 711 | 360,000 | 384,000 | 432,000 |
| | | | | 00.174 | @0.2 f3 | @0.253 | @480 ' | , 009@ | @720 ' |
| PUBLIC BUILDINGS | 65 | 65 | 65 | | 14 | 91 | 31,200 | 39,000 | 46 \$ 800 |
| | | | | @0.550 | 109000 | @0°122 | , 0891@ | @1920 ' | @2400 |
| TOWN RESIDENTIAL | 305 | 305 | 305 | 168 | 183 | 220 | ,512,400 | ,585,600 | 732,000 |
| | | | | @30/1.1DF | @30/1.2DF | @30/1;3DF | @18,000° | @18,000 | @18,000 |
| IRRIGATION (30 HP) | . 15 | 30 | 50 | 409 | 750 | 13154 | 27 0,000 | ,540,000 | 000,000 |
| | | | | 100°1/100F | @7/1°00F | @7/1°00F | 030,000 | 030,000 | 000,050 |
| STREET LIGHTING | 2 | 2 | 2 | 14 | 14 | 14 | 000,09 | 000,09 | 000 09 |
| | | | | @40/1.5DF | @40/1050F | @40/1.5DF | @48,000 | ,0000090 | @84,000 |
| WATER PUMPS (HYANNIS) | 2 | 2 | 2 | 53 | 53 | 53 | 000*96 | 120,000 | 168,000 |
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| PLUS DIST. LOSSES (APPROX.) | | | | | | | 1,144,600 | 1,434,400 | 016% |
| C | | | | | | | | | |
| IOIAL | 1,9359 | 1,534 | 1,584 | 1,848 | 2,562 | 3,318 | 6,361,000 | 8,440,000 | 10,467,000 |
| | | | | | | | | | |

(1) PLEDGED MINIMUMS UP TO \$10.50 PER MONTH. (2) PLEDGED MINIMUMS ABOVE \$10.50 PER MONTH.

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